INTERNATIONAL MIGRATION FLOWS: THE CASE OF SPAIN (1960-1988)*

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ABSTRACT

The purpose of this paper is to understand the factors behind international migration flows. To do so, we present an investigation into the determinants of the Spanish international migration flows. We examine the factors behind these flows over time, and what motivates return migration. We find that emigration responds to unemployment rate differences and to personal disposable income differences in the long run, as well as to rents and wage differences. Return migration flows seem to only respond to unemployment rate differences and to personal disposable income differences.

KEYWORDS: Labour mobility, Unemployment, Time series analysis.

RESUMEN

El objetivo de este documento es determinar los factores existentes detrás de los flujos internacionales de migración. Para ello, se presenta una investigación sobre los determinantes de los flujos internacionales de migración de los españoles, examinándose los factores detrás de estos flujos durante un periodo determinado, y las causas de la inmigración de retorno. Se concluye que la emigración se debe a las diferencias a largo plazo en la tasa de desempleo y en la renta personal disponible, así como a los alquileres y a las diferencias en salarios. Los flujos de inmigración de retorno parecen deberse únicamente a las diferencias en la tasa de desempleo y en la renta personal disponible.

PALABRAS CLAVE: Migración laboral, Desempleo, Análisis de series temporales.

I. INTRODUCTION.

The purpose of this paper is to understand the factors behind international migration flows. We present an investigation into the determinants of these flows and to do so we focus on the evolution of Spanish international migration flows.

During the 1960s and until the first oil crisis, Spain was a major net exporter of labour together with Italy and Yugoslavia. The main migration flows were to Germany and France, which together represented almost 80 per cent of total Spanish emigration to European countries. These flows fell sharply during the 1970s and 1980s. Nowadays, the net outflow has turned to a net inflow of migrants.

The size and magnitude of these flows was quite important. During the 1960s, on average, 0.17% of the Spanish population was migrating to Germany each year. It reached its peak in 1965 with 83,500 migrants (0.26%). In the same period, 0.18% of the population was migrating to France, reaching its peak in 1964 with 93,149 Spaniards moving to France (0.29%). During the 1970s these figures dropped to 0.07% to Germany, and 0.03% to France (from 1974 to 1979 these figures were around 0.02% to Germany and 0.008% to France). They fell even further in the 1980s to 0.01% to Germany and 0.002% to France. Many of these migrants eventually returned. The average figures of return migration from Germany were 0.11% in the 1960s, 0.09% in the 1970s and 0.02% in the 1980s. The Spanish population was approximately 30 million in the 1960s, which means that around 105,000 Spaniards were migrating to Germany and France each year during the 1960s. However, during the 1980s only around 4,500 were migrating.

We are concerned primarily with two issues. First, what are the factors behind the variation of these migration flows over time? Second, what motivates return migration?

With respect to the first question, it can be argued that Spanish emigration has been declining during the period of study because of the rapid pace of industrial growth experienced by Spain. Yet, the sharp drop in 1973–75 may be due to the oil crisis, but not to the normal process of industrialization. And why did emigration not return to previous levels afterwards? Moreover, why did Spaniards migrated massively during the period of most rapid growth in Spain? As to return migration, why did many Spaniards eventually return once their foreign work contracts of one to two years had ended instead of staying and pursuing new contracts?

Emigration and particularly migrants' remittances to Spain contributed to the rapid growth of national product during the 1960s until the first oil crisis. Unemployment was very low (around 2%) because those who could not find a job in Spain could migrate, and the Spanish traditional trade deficit was substantially reduced by the favorable service balance due to emigrants' remittances. But with the 1970s crisis this situation changed. The Spanish economy then experienced a political transition to democracy, an extraordinary wage boom, a fall in migrants' remittances, an increasing trade deficit (oil bill), and the return to Spain of a huge number of migrants looking for jobs.

The paper is organised as follows. In Section II we describe our framework of analysis. Individuals decide whether to migrate or not using utility comparisons. The underlying hypothesis is that migration will occur if the expected utility achievable with migration is higher than the expected utility of staying. In other words, if the expected return of moving is higher than the expected return of staying.

The probability of migration or the number of migrants over the total population is a function of: wage differences (as traditional labour–flow theories point out); unemployment rate differences (as a way of measuring the employment probabilities and the differences in labour market performances); the differences in the standard of living (because people are also concerned about their quality of life); and the cost of migration. We also consider the cost of housing as a relevant variable in the migration decision, partly because housing costs may represent a bigger share of a migrant's budget than that of an average long time resident, and because it may signal housing shortages not perfectly captured in the cost of living.

In Section III we describe the data and in Section IV we present an econometric investigation of the determinants of Spanish migration flows to and from Germany and France. We use aggregate data on Spanish migration flows, and the study will be carried out using standard regression analysis.

According to Davidson et al. (1978), three principles are important for econometric modelling. First, a theoretical model is required to guide our research and the interpretation of the results. Second, an econometric model should be obtained by theory and data based reductions on a statistical model. And finally, a good model should encompass the existing models, i.e. explain their results. We adjust our econometric study to the first two principles. We have not encountered any studies concerning Spanish international migration flows, thus we cannot consider encompassing analysis. At the end of this section we will present the main results.

Interestingly, the analysis supports the view that, for return migration, it is better to use variables translated into home country currency and deflated by home country prices. That is because when emigrants are deciding whether to come back or not they have to compare what they will earn and lose in the home country. However, for emigration the specification in foreign or destination country currency, deflated by foreign prices, is preferable.

We find that return migration only responds to unemployment rate differences and to personal disposable income differences in the long run, while emigration responds to rent price differences and wage differences as well. This result supports the view that when people are deciding whether to emigrate or not they are considering all the information available and take into account all the possible effects of such a decision. They seek higher wages, but take into account the possibility of a higher cost of housing, the possibility of getting a job, and the possibility of improving their standard of living. However, when deciding whether to return or not, they look at the likelihood of getting a job and how their standard of living is going to be affected. Given that they can get a job and that their standard of living will not change much, their social, cultural, and psychological reasons are strong enough to decide to return home.

In Section V we present the main conclusions.

II. THE UNDERLYING FRAMAWORK OF ANALYSIS.

We see migration as a response to market disequilibria in which people migrate when the expected gains of moving are positive. We consider that though people may migrate because of positive wage differentials, this is not the only important factor in explaining migration. The crude wage differential can be substantial between two areas (countries or regions), but it needs to be qualified by the cost of migration, which could act to partially offset some of the wage differential. The cost of migration may account for a fixed cost of moving and relocation (transportation, foregone earnings, psychic costs, etc.), and for the cost of living differences (one of its more relevant components is housing). Furthermore, people will get the higher wage differential only if they are able to get a job in the destination country. Hence the probabilities of getting a job in the destination country, and at home, are also important variables.

The utility function can be written as a function of a consumption bundle of different goods and amenities, such as educational opportunities, health care systems and general living conditions, climate, entertainment (e.g., theater and cultural life), and living space or housing. They form what it can be called "standard of living". Thus, differences in standard of living is an additional factor affecting the migration decision.

Therefore, we consider that when a potential migrant is making his mind up about whether to migrate, he will have to examine various factors: first, the real wage differential between both places; second, the cost of living differences[2]; third, the probabilities of getting a job both in the destination country and in the origin country. These may be

[2]The cost of living differences are part of the real wage, but house and rent prices (as measures of the cost of living) can gather imperfections in the housing market and may not be an important component of prices. Thus, it is interesting to consider them separately.

proxied by the differences of unemployment rates. Some people migrate not only because they will earn more, but also because they cannot find a job in their own areas or countries. They will have a greater probability of getting a job in the other area if the unemployment rate is lower, but it also depends upon the "health" of the labour market of the destination country with respect to the origin country. Finally, the potential migrant will also examine the standard of living in both countries, which, for example, may proxy the availability of amenities.

We would expect the above factors to have the following effects on migration. If the real wage increases in the destination country relative to the origin country, migration will be boosted. An increase in the relative cost of housing in the destination country will discourage migration. When the unemployment rate is higher in the destination country, the possibility of getting a job will be lower, and, thus, decrease the incentive to migrate. The better the labour market performance in the destination country with respect to the country of origin, the higher will be migration. A higher relative standard of life abroad should also increase the tendency to migrate.

Our framework of analysis is based on the typical human capital or random utility approach, where potential migrants would evaluate the present discounted expected costs and returns of moving and staying. They will choose the option that produces the higher net expected return. We present a simple model along those lines for the decision of moving at one point in time, from which we derive the familiar effects of the different economic variables on mobility.

Suppose we have two countries, j= 1,2, denote M_{12} as the outflow rate of migrants from country 1 to country 2. Then, the probability of migrating is given by:

(1) $\Pr\{M_{12} > 0\} = \Pr\{EU_2 > EU_1\} = \Pr\{DEU_2 > 0\}$

where EU_j is the expected utility achievable at country j. The expected utility is formed by labour income, non–labour income, and associated costs. Labour income is the real wage weighted by the probability of being employed. Non–labour income comprises unemployment benefits (defined as a proportion of real wages), returns to assets or investments (non–human wealth), and imputed real return from any unpaid leisure activities (e.g. recreation, culture). Associated costs are those related to migration (e.g. costs of moving, material and psychological, job search, etc.) and those related to living (in this case housing).

The individual's expected utility is then given by:

(2) $EU_1 = \delta_1 w_1 + (1-\delta_1) b w_1 + k_1(1-c_1)$ if he stays in country 1

(3) $EU_2 = \delta_2 w_2 + k_2(1-c_2)$ if he migrates to country 2

where δ_j is the probability of getting a job in j, w_j is the real wage in j. Hence, $\delta_j w_j$ is labour income. Non–labour income is the unemployment benefit, defined as a proportion b of real wages, weighted by the probability of being unemployed; and the non–human wealth (and valuation of leisure) of the individual, denoted by k_j[3], which is reduced by the cost of housing, defined as a proportion c_j of the respective non–human wealth. In the case that the individual migrates, c_2 is the cost of housing and the cost of moving as a proportion of k_2. However, when the individual migrates, his non–labour income will be reduced by the foregone unemployment benefits in the case he would have been unemployed.

With respect to the treatment of price deflators, wages w and non–human wealth k above are in real terms, and are, thus, deflated by prices in country j, p_j (j=1,2). In the

[3]The subindex stands for country, and it means that the non–human wealth is deflated by country 1 prices, k_1, or country 2 prices, k_2.

discussion below about temporary versus permanent migrants we will make the distinction between deflating by national prices or by home country prices.

The variable k_j intends to capture differences in the standard of living, that will be affected by differences in the level of wealth.

Hence, the expected utility differential is given by:

$$\begin{aligned} DEU_2 = EU_2 - EU_1 &= [\delta_2 w_2 + k_2(1-c_2)] - [\delta_1 w_1 + k_1(1-c_1) + (1-\delta_1)bw_1] \\ &= (\delta_2 w_2 - \delta_1 w_1) + (k_2 - k_1) - (k_2 c_2 - k_1 c_1) - (1-\delta_1)bw_1 \qquad (4) \end{aligned}$$

The first term is the wage differential weighted by the differential between the probabilities of getting a job. The term (k_2-k_1) represents the difference between the non–human wealth deflated by destination country and home country prices. If nominal non–human wealth is K then $(k_2-k_1)=\ln(p_1)-\ln(p_2)$. The term $(k_2c_2-k_1c_1)$ represents the cost of housing differential or cost of moving. The last term represents the unemployment subsidy differential. The latter establishes an important distinction between regional and international migration. In the regional migration case you do not lose the unemployment benefits when you move.

Let us now examine the effects of the differentials and of the overall levels on DEU_2, that is, on the migration outflow, using equation (4). We measure the probability of getting a job as 1–u, where u is the unemployment rate. Then, the migration outflow from country 1 to country 2, M_{12}, depends positively on the wage differential and on the probability of getting a job differential, and negatively on the unemployment rate and moving costs differentials. With respect to overall levels, an increase in wages in the home country will have a negative effect on the outflow, but an increase in wages in the destination country will have a positive effect. An increase in the probability of getting a job in the home country, in the standard of living in the home country, and in unemployment benefits will reduce migration outflows. An increase in the unemployment rate in the home country will have a positive effect on the migration outflow, and an increase in the unemployment rate in the destination country a negative effect.

Summing up, we can represent the probability of outflow from country i to country j, taking into account (4), by:

$$\Pr\{M_{ij} > 0\} = f[w_i, w_j, \delta_i, \delta_j, c_i, c_j, k_i, k_j, b, Z_m\} \qquad (5)$$

where Z_m represents other factors, as climate, public services (i.e. education and health care), and amenities. We can also include inter–regional migration flows as well as the stock of migrants abroad. This simple model provides us with the basic analytical structure to study the determinants of migration flows.

Finally, we should distinguish between permanent versus temporary migrants. When potential migrants are making the decision whether to migrate or not, they have to take into account the type of migration, long or short term, they are considering. The first type of migrants, long term migrants, are those who migrate and tend to stay in the destination country for a long period of time. We can consider them as migrants who migrate looking for a higher standard of living, higher earnings, etc. The second type, short term migrants, are those whose migration is temporary and may be caused by the difficulty of getting a job or a suitable remunerated job in the country of origin. They send their money back to relatives in their country of origin or build up a target stock of savings.

The determinants of the migration decision are the same for both types of migrants, but the time dimensionality differs. The first type of migrant is only concerned with the differences in real personal disposable income in destination country prices and origin country prices, the unemployment differences, the difference in real wage rates between destination country in national prices and origin country in national prices, and the difference in real rental prices. The second type of migrant is concerned with the value of his earnings in the currency of his origin country, because if migration is temporary (to build up savings), the expected earnings need to be deflated by expected prices in the origin country and not by the prices in the destination country. Destination country cost of living will continue to matter in this case, affecting savings, but will exert less influence.

For the second type of migrant, the foreign nominal wage rate will be translated into national currency and deflated by national prices and compared with national real wage rate. And the foreign nominal per head disposable income is translated to national currency and deflated by national prices. We will use the exchange rates between both countries to translate to national currency. This choice is based on the fact that when they send money back home, their families will receive the money in their national currency unit, and the money was exchanged into the national currency by the official exchange rate.

The model represented in equation (4) treats migration as permanent. In the case of temporary migration the term $(k_2-k_1)-(k_2c_2-k_1c_1)$ becomes $k(c_2-c_1)$, where k is the nominal non–human wealth deflated by prices in the home country. With respect to real wages, given a general specification: $\alpha_1(\ln(W_2)-\ln(p_1)) - \alpha_2(\ln(W_1)-\ln(p_1) - \alpha_3(\ln(p_2)-\ln(p_1))$, a model that considers migration as permanent assumes that $\alpha_3=\alpha_1$, but a model of temporary migration assumes that $\alpha_3=0$.

III. THE DATA.

Before turning our attention to the econometric analysis, it is important to review the observations of certain variables selected by theory. For an explanation of how all these variables have been obtained and their sources, see the data appendix. All series in this study are annual, and, unless specified to the contrary, expressed in logs.

Figure 1 shows the time series of emigration and return migration to and from Germany, the emigration to France, and the average emigration to both countries. The salient features are the strong migration up to the 1973–4 oil crisis, and the pattern of return migration, which follows the flow migration pattern with approximately a two year lag. It also shows a marked reduction since the mid–1970s, paralleling the reduction in rates of labour turnover and internal mobility within Spain.

The sharp drop which occurred in 1967 is noteworthy. It is not a particular feature of Spanish migration. It is common to all countries exporting labour to Germany at the time. The cause of this sharp fall was that the German economy suffered a recession in 1967–8. The number of foreign workers decreased from 1.3 million in September 1966 to 904,000 in January 1968 and, thereafter, reached its pre–recession level in June 1969. This drop was reflected in both a reduction of the stock of foreign workers (increase of return migration) and a lower immigration flow.

Figure 2 shows the real wage differential series. They are characterised by a steady decline over the period of analysis, except for a sharp drop between 1973 and 1977, due to the Spanish wage boom (related to an increase of union pressure and the political transition to a democracy, see Dolado et al.(1986)).

Figure 3 presents the time series of unemployment rates for Germany, Spain, and the difference between the two, as well as the average of German and French unemployment rate, ugf, and its difference with the Spanish rate, ud. Again it is important to stress the 1967–8 recession suffered by the German economy and, to a lesser extent, the French economy.

Spanish unemployment was very low (around 2%) and stable during the 1960s up to 1973, but it has risen sharply since then. In 1985 it reached its peak at 21.5%. However, the bulk of Spanish emigration occurs in the 1960s, thus reflecting the fact that the Spanish economy could not absorb all the available working age population, and people had to move to seek jobs. The unemployment rate differential is driven up to the oil crisis by the German/French average unemployment rate, and then by the Spanish unemployment rate.

Figure 4 shows the real rent price index for Germany and Spain. It takes 1980 as its base point. The Spanish index displays a steady decline trend relative to Germany and the German and French average. The real cost of housing in Spain was higher in the 1960s and at the beginning of the 1970s than it has been in recent years (at 1980 prices). Emigration would have been weakened as a result of this phenomenon.

We could explain this phenomenon with the argument that policies by which the government finances housing costs increase income differentials in favour of the destination area. This would provide an incentive for immigration and might, therefore, worsen the housing problem because more migrants would be demanding housing. This argument allows us to justify the higher real cost of housing in Spain in the 1960s relative to the 1970s and 1980s. Spain in the 1960s went through a process of urbanization, with large numbers of people moving from rural areas to urban areas. During this same period, the Spanish government was financing housing in the cities.

We should use caution, however, when considering these indices. They express average rental prices to the extent that Spain's fall in real rental prices was due to rent controls and, therefore, emigration may have been increased by increased difficulties in securing rented property. That is, average prices may not be marginal prices, when rents are controlled. Thus, real average rental prices could be falling, but the rent price that young people and return migrants face to secure rented property could be increasing.

Figures 5 and 6 show real personal disposable income differentials (in national prices and in Spanish prices), and the employment growth differentials, respectively.

IV. AN ECONOMETRIC STUDY.

We now present the results of estimating the model of migration flows specified by equation (5). We do not know the actual data generating process of migration, but we will try to get as close as we can to it, using theory and the main properties of the observed data. In order to get an empirical econometric model of migration we begin with a general specification of (5) and by reparametrization/restriction, using theory and what data tell us, we will get our empirical model. Once we have the model, we test for restrictions and modelling assumptions.

The study follows two complementary paths. We examine the Spanish emigration flows, spmi, and the return migration flows, spbkgr. There is no available data for return migration from France.

To present our results we start with a general model for both variables, in which we include lags in the driving variables. We use a twofold approach. First, we consider a first order general distributed lag in the driving variables. But, in a second stage, we consider that the lag structure could be longer to take into account long run dynamic relationships, thus we include two lags in the driving variables. We use a "general to specific" methodology (see Gilbert (1986)), which starts with a deliberately overparametrized specification before undertaking data based simplification using theory, where appropriate, to guide the choice of restrictions. However, there is a risk of getting nonsense results if overparametrization is pushed too far. This is the reason for considering a reference specification in which the maximum lag is one year.

In our empirical specification we are going to consider the following variables. First, we consider the wage differential between the home and destination countries. Second, we consider the unemployment differential, as well as overall levels. The German unemployment rate, lugr, for return migration, and the average unemployment rate in Germany and France, ugf, for emigration, are introduced in the regressions because we test for symmetry of unemployment effects.

Third, we consider the cost of moving, which measures differences in the cost of living (housing). It is a relevant variable to explain migration partly because housing costs may represent a bigger share of the budget for migrants than for average long time residents, and because it may signal housing shortages not perfectly captured in the price of living. When people have to move from one area to another, they incur changes in the cost of housing. We do not have data on housing prices, thus we use the real rent price index differential.

Fourth, we consider the standard of living, which is determined by the level of wealth and income. Labour income is measured by wages. We proxy the level of wealth or standard of living by the real personal disposable income, which incorporates income from financial and physical assets and tax effects as well.

Fifth, we consider employment growth differences or participation rate differences which may account for differences in labour market performance and thus measure the "health" of the labour market in the destination country and at home. This could reflect expectations of future unemployment rates and thus be proxied by unemployment rates. As we shall see in the empirical econometric specifications, this variable does not appear in the more parsimonious specifications.

Sixth, we consider the inter–regional migration rate which is included in the emigration analysis, but not in the return migration case. The regional migration flow variable could have two different effects. It might have a negative effect on international migration flows via a substitution effect. But it could also have a positive effect reflecting the view that an increase in regional migration reflects a higher mobility rate in the labour force. Bentolila and Dolado (1990) report a reduction in regional mobility in Spain while international outflows have fallen as well.

Seventh, we use a dummy variable to capture the wage boom of the 1970s (see Dolado et al. (1986)). This variable is, 1 from 1973 (death of Franco's Prime Minister) to 1977 (Pactos de la Moncloa), and zero otherwise. It controls for the Spanish wage boom, the higher level of union pressure and the political transition. Moreover, it may also controls for the German Immigration Stoppage Act.

Foreign workers coming from an EC member country cannot be prohibited, in general terms, from working in Germany or France. For the employment of non–EC workers, firms require permission, which can be obtained as long as the vacancies cannot be filled by German workers (in the 1967 recession there was no hiring of foreign workers). In 1973 the German government enacted the Immigration Stoppage Act: in the case of excess labour supply, the government can stop the inflow of foreign workers coming from non–EC countries. This immigration stop is still in operation, but it was not a complete one (see Franz (1991) for a discussion). Moreover, the inflow of foreign workers, in the case of Spanish workers, was stopped mainly in the first few years.

Eighth, we consider the stock of migrants. A positive effect could be interpreted as proxying for a reduction in informational and settling down costs for new migrants.

Finally, we introduce lagged values to capture long run relationships and hysteresis effects. The lagged value of the dependent variable is intended to capture inertia effects.

We consider as an additional variable the replacement ratio in the origin country. It is important to note that in the 1960s wide unemployment benefit coverage in Spain did not exist, while in the 1980s the unemployment benefit system became quite generous. Other variables controlling for education and health care differences could also be added, which could be proxied by the differential in national expenses in these areas, but it is not available for the period under investigation. However, the differences in standard of living also intend to capture these effects.

We specify the relationship driving both variables (emigration and return migration) to account for both types of migrants (short and long term migrants). Wages and personal income variables are deflated by national prices in one case (lrwd, lrpdid, and rwd), and in the other case wages and personal income are in Spanish currency and deflated by Spanish prices (lrwd2, lrpdi3, and rwds).

From the first regression we can detect that, for return migration, the model in Spanish prices is more appropriate statistically. This confirms the view that when people take the decision whether or no to return, they are comparing earnings and standards of living abroad with those in Spain in Spanish prices. However, for emigration this is not necessarily the case, and at the beginning it is difficult to decide which specification works better. When we introduce restrictions seeking a more parsimonious specification it turns out that the one in national prices is more appropriate.

Therefore, throughout the study we model return migration with wages and personal disposable income in Spanish currency deflated by Spanish prices. Emigration is modelled with wages and disposable income in national currency. This could be the case if, when the individual is deciding whether or no to emigrate, he evaluates the standard of living in the destination country in terms of that country and the standard of living in his origin country in terms of his origin country. However, when deciding whether or no to return, he compares the standard of living in the destination country in terms of his origin country.

Return Migration.

Results are reported in Tables 1A1–1A2. We begin with a deliberately overparametrized general specification. The first general specification contains one lag in all the driving variables, except in emigration and the stock of migrants. We introduce a second lag in the emigration to Germany variable to account for duration. We saw in Figure 1 that return migration had a very similar path than emigration, except for approximately two lags of difference. We start with a simple short–run dynamic structure because we only have 28 observations and the structure is very complex.

We introduce emigration and the stock of Spanish migrants in Germany for two reasons. First, return migration is obviously going to be determined by emigration (their correlation is very high). As more people emigrate today there are more future potential return migrants. Secondly, the stock of Spanish migrants can account for sociological, psychological and informational factors. The more Spaniards there are in the destination country the more the possible psychological cost of moving can be lessened and the process of adaptation can be made easier. Thus a positive effect would reflect a reduction in informational and settling down costs for new migrants.

From the general one lag overparametrised model we get a more restrictive/ parsimonious model by undertaking data and theory based simplifications. The empirical econometric model we obtain is:

$$\mathrm{spbkgr}_t = c + \beta_2 \mathrm{spmigr}_{t-1} + \beta_3 \mathrm{spmigr}_{t-2} + \beta_4 \mathrm{stock}_{t-3} + \beta_5 \Delta \mathrm{lrpid}_t + \beta_6 \Delta \mathrm{lrwd2}_t$$

$$+ \beta_7 \text{lud}_t + \beta_8 \text{lud}_{t-1} + \beta_9 \text{lrpdi3}_{t-1} + \beta_{10} \text{dv}_t \qquad (6)$$

The return migration is driven by the first and second lag of emigration, the third lag in the stock of migrants, and the rate of change in rent prices and wage variables, as well as the current and lagged unemployment, and yesterday's disposable income. The dummy variable turned out to be barely significant. The specification without the dummy variable (Table 1A2) seems to perform statistically better.

We thought that the lag structure may be longer in order to account for long–run dynamics. Therefore, we start with an overparametrized two lag general form. We repeat the data and theory based simplification exercise in order to reach a more parsimonious specification. We then obtained an econometric specification with only one distinction, the rent price variable enters as a two period rate of change instead of a one period rate of change:

$$\begin{aligned} \text{spbkgr}_t &= c + \beta_2 \text{ spmigr}_{t-1} + \beta_3 \text{ spmigr}_{t-2} + \beta_4 \text{ stock}_{t-3} + \beta_5 \Delta_2 \text{lrpid}_t + \\ &\beta_6 \Delta \text{lrwd2}_t + \beta_7 \text{lud}_t + \beta_8 \text{lud}_{t-1} + \beta_9 \text{lrpdi3}_{t-1} + \beta_{10} \text{dv}_t \end{aligned} \qquad (7)$$

We, therefore, have specifications (6) and (7) for return migration (Table 1A1). We also report the same specifications but without the dummy variable (Table 1A2). However, this variable seems to be statistically relevant in specification (7).

Both specifications provide the same features about their explanation of return migration. First, levels in unemployment rate differentials and disposable income differentials are more important than changes in these differentials. For disposable income differentials, yesterday's level is the relevant one, while for unemployment rate differentials both today's and yesterday's levels are relevant. The lag structure of unemployment rate differentials could be reflecting hysteresis effects on migration. Second, changes in rent price differentials and wage differentials are more important in explaining return migration than levels in these differentials. Third, emigration and the stock of migrants, representing flow and stock variables, are other factors which need to be taken into account.

Finally, we subjected these specifications to several diagnostic and specification tests. Both versions of specification (6), with and without the dummy variable, present problems of structural change around 1974–75. The LR test for deleting the dummy variable accepts the null hypothesis that the dummy should be deleted, and a test of adding omitted variables rejects the hypothesis that this variable should be added. Therefore, specification (6) without the dummy variable is preferable. Recursive least square graphical techniques (recursive residuals, CUSUM, and CUSUMSQ) point to a structural break.

With respect to specification (7), only the version with the dummy variable presents problems of structural change around 1974–75. Recursive least square graphical techniques support this point. Moreover, it also presents serial correlation problems. If we drop the dummy variable, correlation problems disappear. However, the LR test for deleting this variable reject the hypothesis that the dummy should be deleted.

Non–nested hypothesis test for model selection (Table 3) hint that for the case of a general model embedding the four specifications, specification (7), with and without the dummy, pass the F test of linear restrictions. The Vuong test suggests that specification (7) with the dummy is the one that fits the data better.

Emigration.

Results are reported in Tables 2A1 to 2A4. We follow the same twofold approach as for return migration. From the general overparametrized specification, which includes one lag in the driving variables, we reach by data and theory based simplifications the following empirical econometric specification (Table 2A1):

$$\begin{aligned} spmi_t &= c + \beta_1\, spmi_{t-1} + \beta_2\, rpid_t + \beta_3\, \Delta rwd_t + \beta_4\, ud_t + \beta_5\, did_t \\ &\quad + \beta_6\, \Delta ugf_t + \beta_7\, reg_t \end{aligned} \tag{8}$$

This model corresponds to an Error Correction Mechanism (ECM), introduced by Davidson et al. (1978), where the general specification:

$$y_t = \alpha_1 y_{t-1} + \Lambda_1 x_t + \Lambda_2 x_{t-1} \tag{9}$$

can be reparametrized as follows:

$$\begin{aligned} \Delta y_t &= (\alpha_1-1)y_{t-1} + \Lambda_1 \Delta x_t + (\Lambda_1+\Lambda_2)x_{t-1} = \\ &= \Lambda_1 \Delta x_t + (\alpha_1-1)\,[y_{t-1} - [(\Lambda_1+\Lambda_2)/(1-\alpha_1)]x_{t-1}] \end{aligned} \tag{10}$$

where K= $(\Lambda_1+\Lambda_2)/(1-\alpha_1)$ is the long run response of y to x. The new parameters $(\Lambda_1,(1-\alpha_1),K)$ correspond to the impact effect, the feedback effect and the long run response. The term $(y-Kx)_{t-1}$ was called ECM in Davidson et al.(1978), because it reflects the deviation from the long run outcome, with agents removing $(1-\alpha_1)$ of the resulting disequilibrium in each period.

We also investigated a longer lag structure with a more general overparametrized specification. Sequential reduction yields the following empirical econometric specifications:

$$\begin{aligned} spmi_t &= c + \beta_1\, spmi_{t-1} + \beta_2\, rpid + \beta_3\, \Delta rwd_t + \beta_4\, ud_t \\ &\quad + \beta_5\, \Delta^2 did_t + \beta_6\, \Delta ugf_t + \beta_7\, dv_t + \beta_8 reg_t \end{aligned} \tag{11}$$

$$\begin{aligned} spmi_t &= c + \beta_1\, spmi_{t-1} + \beta_2\, rpid_{t-1} + \beta_3\, \Delta rwd_t + \beta_4\, rwd_{t-2} + \beta_5\, ud_t \\ &+ \beta_6\, \Delta^2 did_t + \beta_7\, \Delta ugf_t + \beta_8\, dv_t + \beta_9 \Delta reg_{t-1} \end{aligned} \tag{12}$$

$$\begin{aligned} spmi_t &= c + \beta_1\, spmi_{t-1} + \beta_2\, rpid_{t-1} + \beta_3\, \Delta rwd_t + \beta_4\, rwd_{t-2} \\ &+ \beta_5\, ud_t + \beta_6\, \Delta^2 did_t + \beta_7\, \Delta ugf_t + \beta_8\, dv_t + \beta_9 reg_t \end{aligned} \tag{13}$$

Thus, the four alternative econometric specifications for emigration are represented by equations (8), (11), (12) and (13), the results of which are reported in tables 2A1 to 2A4. They differ in their explanation of emigration flows in various respects. First, levels in disposable income differentials are important in specification (8), while the rate of acceleration in disposable income differentials is more important than levels in specifications (11), (12) and (13). Second, changes in wage differentials are important in specifications (8) and (11), and both levels and changes are important in specification (12) and (13). Third, the dummy variable is not relevant in specification (8). Finally, changes in regional migration flows are relevant in specification (12), while levels in regional migration flows are relevant in specifications (8), (11) and (13).

We could not find any relevant effect of the employment growth rate differential variable. The unemployment rates may be capturing all the relevant effects with respect to employment probabilities and labour market performances. We were also unable to find any relevant effect of the replacement ratio variable. This suggests that the unemployment benefit system in Spain has not played an important role in migration flows.

It is important to point out that there is a high negative correlation between the rent price differential variable lagged one period and the wage differential variable lagged two periods (ie. $corr(rpid_{-1}, rwd_{-2}) = -0.98$) for specifications (12) and (13). This could be explained in the following way. If we assume an increase in emigration, this increase will reduce the work force in Spain, exerting an upward pressure on wages and, at the same time, it will increase the work force in the destination country where there will be a downward pressure on wages. Thus, by both effects, wage differentials will decrease. However, there will be more people looking for housing in the destination country and less at home, which entails an increase in rent price differentials. It will take one period for this link to occur.

Finally, we also present in these tables several diagnostic and specification tests. All the specifications are problematic with respect to the Chow test of no–structural change. We consider the structural break in 1974–5. This is a very demanding test, note the dramatic difference in behaviour before and after 1974–5 displayed in Figure 1. Yet, specification (8) (table 2A1, model 2A1) barely rejects the null of no structural change, but the recursive least square techniques report strong evidence of structural change around 1973–75.

Specification (12) (table 2A3, model 2A3) rejects the hypothesis of forecast parameter constancy, while specifications (8), (11) and (13) accept the null.

Non–nested hypothesis tests for model selections (Table 3) hint that all four models are equally valid with respect to the F test of linear restrictions on the general model embedding them. However, the Vuong test suggests that models 2A2, 2A3, and 2A4 fit the data better than model 2A1 (from specification (8)), but we cannot discriminate between these three. We tend to prefer specification (11), model 2A2, because of its more straightforward economic interpretation. Additionally, the diagnostic and specification tests do not reject this choice, but actually tend to support it.

The ***main results***[4] of our investigation are the following: First, the labour market performance differences, as well as employment probabilities, are accounted for in the unemployment rates. Thus, unemployment rate differentials are a key variable in explaining migration flows. In return migration, as well as in emigration, levels and not changes in unemployment rate differentials are the important effects in explaining migration flows. However, for emigration, changes in unemployment rates in the destination country are also relevant. The analysis showed that the unemployment effects are better measured by unemployment differences and by the unemployment rate of the destination country.

Second, levels and not changes in disposable income differentials are more important in explaining return migration. For emigration the rate of acceleration is the relevant effect.

Third, changes rather than levels in wage differentials are more important in explaining migration flows. If we consider that expected income differentials may be measured by both real wages differentials and real personal disposable income differentials, then changes as well as levels in income differentials are both important in explaining migration flows, except for specification (11) (Table 2A2) where only changes are relevant.

Fourth, we can conclude that Spanish migration flows suffered a structural break around 1974–75.

Fifth, if one expects the rent price variable to be an important component of prices, then the lag structure of the wage (or income) variable and rent price variable should be

[4]Throughout the text when we refer to differences in one variable we mean differences between countries in this variable, and when we refer to changes we mean changes in time.

the same. If this is not the case, then the coefficient of rent price variable may reflect imperfections or shortages in the housing market. The different pattern in rent prices between Spain and Germany/France in the 1960s, reported in the data section above, could imply such imperfections.

Let p^* be the general price index and W be the nominal wage. The log of real wages is $\log(W) - \log(p^*)$. If we assume that the general price index is the weighted sum of the rent price index, r, and the other price index, p; that is, $\log(p^*) = \theta\log(r) - (1-\theta)\log(p)$ where θ is the weight. Then the log of real wages could be expressed as:

$$\log(W/p^*) = \log(W) - \log(p^*) = \log(W) - \theta\log(r) - (1-\theta)\log(p) =$$
$$= \log(W/p) - \theta\log(r/p) \qquad (14)$$

Thus, the lag structure of the wage variable and the rent price variable should be the same in the case that rent prices are purely a component of prices. But if the rent price variable accounts for imperfections in the housing market, then it could appear in the regressions as:

$$\log(r/p^*) = \log(r) - \log(p^*) = \log(r) - \theta\log(r) - (1-\theta)\log(p) =$$
$$= (1-\theta)\log(r/p) \qquad (15)$$

Then, the lag structure of both variables could be different. Our results support this latter view, that is, that rent prices may be partly reflecting imperfections in the housing market. In the return migration specifications, the lag structure of wages and rent prices is not the same for specification (7), while for specification (6) it is the same. If we consider disposable income and wages together as a general income variable, the lag structure is then different for both specifications. For the emigration specifications, they all present a different lag structure for the wage variable and the rent price variable (the different lag structure also holds if we consider disposable income as well).

Sixth, we now discuss the steady state solutions and implications of our estimated equations. We define the steady state variables as $x_{t-j} = x^{*}$, $\forall j=0,N$.

The long run equilibrium of return migration only responds to unemployment rate differentials and to personal disposable income differentials, as well as to emigration, and to the stock of migrants. The long run equilibrium of emigration responds to rent price differentials and the wage differentials, as well as to the unemployment rate and personal disposable income differentials. This may be explained by the fact that when people are deciding whether to migrate or not they consider all the relevant variables and their effects (which are available to them, given informational restrictions). They seek higher wages, taking into account the possibility of higher cost of housing, to get a job, and to improve their standard of living. However, when emigrants want to return to their country of origin for social and psychological reasons (e.g. family, home, friends, cultural similarities), but they cannot get a job (this is the reason for the inclusion of the unemployment rate variable) or their standard of living will shrink too much (this is the reason for the personal disposable income variable), they will more than likely give up the idea of going back. On the other hand, if they can get a job and their standard of living will not drop, presumably, their social, cultural and psychological reasons will be strong enough for them to decide to return home.

Seventh, we investigate the extent to which only differentials matter. There exists the idea that all voluntary flows are higher in good times than in bad. In other words, there must be some effect of the overall level of economic activity, not just a differential. For this reason, both the unemployment rate in the market of origin and the unemployment rate in the destination market were included. The unemployment rate in Germany is an important variable in emigration flows, reflecting that the level of economic activity in the destination country does matter. However, in the long run only the difference between destination and home country unemployment rates matters.

V. CONCLUSIONS.

We have analyzed the determinants of migration decisions. We have constructed an empirical model identifying and explaining the main determinants of Spanish migration flows to and from Germany and France. We first reviewed the main features of Spanish migration flows. We then introduced the underlying framework of analysis which helped to highlight the relevant variables explaining migration flows.

We find that levels in unemployment rate differentials are more important than changes, yet for flow emigration, the rate of change in unemployment rates in Germany and France is also relevant. Levels, as well as changes in income differentials (where income comprises wages and disposable income) are also important effects in explaining migration flows. The cost of housing, measure by the rent price index differentials is important as well. The level of rent price differentials is the relevant effect on emigration, whereas the rate of change is the important effect on return migration. The steady state solutions of our estimated equations suggest that the long run equilibrium of return migration is determined by unemployment rate differentials and personal disposable income differentials, as well as emigration, and the stock of migrants. The long run equilibrium for emigration, in contrast with return migration, is influenced by wage differentials, rent price differentials, unemployment rate differentials, and disposable income differentials.

What implications do our results have for future Spanish migrations flows? Our analysis suggests that if the gap between real wages abroad and those in Spain falls, and if the gap between housing costs, personal disposable income, and unemployment rates do not change, emigration will continue to fall.

Given that emigration is already low, that real wage differences are disappearing, as well as the differences in housing costs, that the gap in per capita disposable income is stable or shows a slow tendency to narrow, and that the differences in unemployment rates may not increase further (in any case the difference will tend to fall), given the process of economic integration and homogenization within Europe, we do not, therefore, expect large changes in the pattern of Spanish migration in the near future. It will be low at the current levels, around 0.003 per cent of Spanish population. Figures of migration flows as high as in the 1960s are very unlikely to occur again.

These results could also be useful to draw some implications for European migration flows. The tendency within EC borders is towards homogenization and to the reduction in regional differences through the EC regional and compensation policies. Given these tendencies, it may then be unlikely to see large movements of labour within the EC, and we do not expect changes from the current levels. Immigration flows from outside the EC borders are more prone to be large given the economic differences.

Table 1A1.
Return Migration Equations by OLS for 1963—88
Dependent variable: ratio of returns from Germany to Spanish population

$$\underset{}{spbkgr_t} = \underset{(0.12)}{0.016} + \underset{(10.54)}{0.384}\, spmigr_{t-1} + \underset{(6.34)}{0.274} spmigr_{t-2} + \underset{(1.70)}{0.036} stock_{t-3} + \underset{(5.01)}{3.456}\Delta lrpid_t$$
$$\underset{(-3.88)}{-1.183}\,\Delta lrwd2_t + \underset{(4.43)}{0.310} lud_t - \underset{(-3.84)}{0.236} lud_{t-1} - \underset{(-3.52)}{1.419} lrpdi3_{t-1} + \underset{(1.18)}{0.084} dv_t$$

$$spbkgr_t = \underset{(1.10)}{0.084} + \underset{(9.20)}{0.393} spmigr_{t-1} + \underset{(5.48)}{0.256} spmigr_{t-2} + \underset{(1.71)}{0.021} stock_{t-3} + \underset{(7.41)}{2.261}\Delta_2 lrpid_t$$
$$\underset{(-5.13)}{-1.088}\,\Delta lrwd2_t + \underset{(6.01)}{0.370} lud_t - \underset{(-5.19)}{0.251} lud_{t-1} - \underset{(-4.16)}{1.378} lrpdi3_{t-1} + \underset{(3.24)}{0.144} dv_t$$

$\bar{R}^2$	0.9761	0.9850
SE	0.0888	0.0704
DW	2.000	2.5416
	Test for Serial Correlation	
LM for AR(1)	0.01088	2.6967
LM for AR(2)	0.78238	6.71504
	ARCH χ^2 Test	
1 lag	0.004	0.8631
2 lags	1.1777	0.6772
3 lags	1.50860	0.047825
	Normality χ^2 Test	
	1.4503	1.3286
	Test of Parameter Constancy	
One forecast	0.1089	0.1941
Two forecasts	0.4593	0.2601
Three forecasts	0.3873	0.2539
	Chow—F test for Structural Breakdown	
1974	18.2613	4.60905
1975	23.9831	2.1761
1976	0.76470	2.27798

Nb. We report t—ratios in parenthesis. T—ratios are from heteroscedastic consistent standard errors.
Durbin's h statistic test for AR(1) serial correlation when the lagged dependent variable is a regressor. If $|h|<1.645$ we accept the null of no serial correlation, at 5% confidence level.

LM test for AR(n) serial correlation is distributed as $\chi^2(n)$. We accept the null of no serial correlation at 5% confidence if LM<3.841 for AR(1) and if LM<5.991 for AR(2).

The ARCH test is compared against $\chi^2(1)=3.841$, $\chi^2(2)=5.991$, and $\chi^2(1)=7.815$ at 5% confidence, respectively. And the Normality χ^2 test is compared against $\chi^2(1)=3.841$.

The F—statistic for structural breakdown is compared against $F_6^{10}(\alpha=5\%)=4.06$ and $F_6^{10}(\alpha=1\%)=7.87$.

The test of parameter constancy (Chow Forecast Test) is compared against $F_{0.05}(1,15)=4.54$, $F_{0.05}(2,14)=3.74$, and $F_{0.05}(3,13)=3.49$, respectively.

Test for deleting dv: column (1), LR=2.02638<$\chi^2(1)$, we then accept the hypothesis that dv should be deleted. Column (2), LR=8.93596, we then reject the null.

Table 1A2.
Return Migration Equations by OLS for 1963—88
Dependent variable: ratio of returns from Germany to Spanish population

$$\underset{}{spbkgr_t} = \underset{(-0.70)}{-0.090} + \underset{(9.92)}{0.379} spmigr_{t-1} + \underset{(5.87)}{0.268} spmigr_{t-2} + \underset{(2.99)}{0.056} stock_{t-3} + \underset{(6.07)}{3.724} \Delta lrpid_t$$
$$\underset{(-3.30)}{-1.149} \Delta lrwd2_t + \underset{(5.10)}{0.338} lud_t - \underset{(-5.16)}{0.280} lud_{t-1} - \underset{(-2.84)}{1.238} lrpdi3_{t-1}$$

$$spbkgr_t = \underset{(-0.63)}{-0.07} + \underset{(7.29)}{0.386} spmigr_{t-1} + \underset{(4.21)}{0.234} spmigr_{t-2} + \underset{(3.84)}{0.055} stock_{t-3} + \underset{(4.80)}{2.275} \Delta_2 lrpid_t$$
$$\underset{(-3.33)}{-0.997} \Delta lrwd2_t + \underset{(5.37)}{0.432} lud_t - \underset{(-4.63)}{0.322} lud_{t-1} - \underset{(-2.37)}{0.979} lrpdi3_{t-1}$$

$\bar{R}^2$	0.97572	0.98014
SE	0.08961	0.08105
DW	2.04343	2.07583
	Test for Serial Correlation	
LM for AR(1)	0.02717	0.15983
LM for AR(2)	0.91412	2.31527
	ARCH χ^2 Test	
1 lag	1.01882	0.11555
2 lags	2.65067	0.21445
3 lags	4.24979	0.59497
	Normality χ^2 Test	
	0.218797	0.526068
	Test of Parameter Constancy	
One forecast	0.02171	0.04153
Two forecasts	0.48045	0.12684
Three forecasts	0.41625	0.85090
	Chow—F test for Structural Breakdown	
1973	22.4205	7.92411
1974	22.6965	2.52765
1975	31.3717	1.46979
1976	17.8458	1.47120

Nb. We report t—ratios in parenthesis. T—ratios are from heteroscedastic consistent standard errors.
Durbin's h statistic test for AR(1) serial correlation when the lagged dependent variable is a regressor. If $|h|<1.645$ we accept the null of no serial correlation, at 5% confidence level.

LM test for AR(n) serial correlation is distributed as $\chi^2(n)$. We accept the null of no serial correlation at 5% confidence if LM<3.841 for AR(1) and if LM<5.991 for AR(2).

The ARCH χ^2 test is compared against $\chi^2(1)=3.841$, $\chi^2(2)=5.991$, and $\chi^2(1)=7.815$ at 5% confidence, respectively.

The Normality χ^2 test is compared against $\chi^2(1)=3.841$.

The F—statistic for structural breakdown is compared against $F^9_8(\alpha=5\%)=3.39$ and $F^9_8(\alpha=1\%)=5.91$.

The test of parameter constancy (Chow Forecast Test) is compared against $F_{0.05}(1,16)=4.49$, $F_{0.05}(2,15)=3.68$, and $F_{0.05}(3,14)=3.34$, respectively.

Table 2A1.
Emigration Equations by OLS for 1961—88.
Dependent variable: Spanish emigration to Germany and France weighted by Spanish population

$$\underset{}{spmi_t} = \underset{(-2.05)}{-0.320} + \underset{(4.58)}{0.490 spmi_{t-1}} - \underset{(-5.10)}{1.397 rpid_t} + \underset{(2.14)}{2.627 \Delta rwd_t} - \underset{(-3.44)}{0.228 ud_t} + \underset{(1.99)}{1.106 did_t} - \underset{(-4.65)}{0.685 \Delta ugf_t} + \underset{(2.22)}{0.084 reg_t}$$

$\bar{R}^2$	0.9761
SE	0.1388
DW	1.9121
	Test for Serial Correlation
LM for AR(1)	0.0201
LM for AR(2)	0.3314
Durbin'h for AR(1)	–0.23367
	ARCH χ^2 Test
1 lag	0.0684
2 lags	1.1138
3 lags	1.1437
	Normality χ^2 Test
	0.127566
	Chow—F test for Structural Breakdown
1972	3.99081
1973	3.50776
1974	1.01062
1975	0.94629
1976	0.75786
	Test of Parameter Constancy
One forecast	0.15854
Two forecasts	0.44311
Three forecasts	0.28168

Nb. We report t—ratios in parenthesis. T—ratios are from heteroscedastic consistent standard errors.
Durbin's h statistic test for AR(1) serial correlation when the lagged dependent variable is a regressor. If $|h|<1.645$ we accept the null of no serial correlation, at 5% confidence level.

LM test for AR(n) serial correlation is distributed as $\chi^2(n)$. We accept the null of no serial correlation at 5% confidence if LM<3.841 for AR(1) and if LM<5.991 for AR(2).

The ARCH χ^2 test is compared against $\chi^2(1)=3.841$, $\chi^2(2)=5.991$, and $\chi^2(1)=7.815$ at 5% confidence, respectively. The Normality χ^2 test is compared against $\chi^2(1)=3.841$.

The F—statistic for structural breakdown is compared against $F^8_{11}(\alpha=5\%)=2.95$ and $F^8_{11}(\alpha=1\%)=4.74$.

The test of parameter constancy (Chow Forecast Test) is compared against $F_{0.05}(1,19)=4.38$, $F_{0.05}(2,18)=3.55$, and $F_{0.05}(3,17)=3.20$, respectively.

Table 2A2.
Emigration Equations by OLS for 1962—88.
Dependent variable: Spanish emigration to Germany and France weighted by Spanish population

$$
\underset{}{spmi_t} = \underset{(-3.94)}{-0.335} + \underset{(5.42)}{0.415spmi_{t-1}} - \underset{(-8.60)}{1.765rpid_t} + \underset{(4.83)}{2.884\Delta rwd_t} - \underset{(-6.67)}{0.339ud_t} + \underset{(2.88)}{1.780\Delta^2 did_t}
$$

$$
- \underset{(-8.26)}{0.701\Delta ugf_t} + \underset{(3.41)}{0.083reg_t} - \underset{(-3.96)}{0.229dv_t}
$$

$\bar{R}^2$	0.9860
SE	0.1052
DW	1.6761
	Test for Serial Correlation
LM for AR(1)	0.5592
LM for AR(2)	1.43263
Durbin'h for AR(1)	1.1111
	ARCH χ^2 Test
1 lag	1.5989
2 lags	1.9772
3 lags	2.1174
	Normality χ^2 Test
	0.458216
	Chow—F test for Structural Breakdown
1974	9.74653
1975	9.75780
1976	7.25838
	Test of Parameter Constancy
One forecast	0.000045
Two forecasts	2.1718
Three forecasts	1.5295

Nb. We report t—ratios in parenthesis. T—ratios are from heteroscedastic consistent standard errors.
Durbin's h statistic test for AR(1) serial correlation when the lagged dependent variable is a regressor. If $|h|<1.645$ we accept the null of no serial correlation, at 5% confidence level.

LM test for AR(n) serial correlation is distributed as $\chi^2(n)$. We accept the null of no serial correlation at 5% confidence if LM<3.841 for AR(1) and if LM<5.991 for AR(2).

The ARCH χ^2 test is compared against $\chi^2(1)=3.841$, $\chi^2(2)=5.991$, and $\chi^2(1)=7.815$ at 5% confidence, respectively.

The Normality χ^2 test is compared against $\chi^2(1)=3.841$.

The F—statistic for structural breakdown is compared against $F_9^9(\alpha=5\%)=3.18$ and $F_9^9(\alpha=1\%)=5.35$.

The test of parameter constancy (Chow Forecast Test) is compared against $F_{0.05}(1,17)=4.45$, $F_{0.05}(2,16)=3.63$, and $F_{0.05}(3,16)=3.29$, respectively.

Table 2A3.
Emigration Equations by OLS for 1963—88.
Dependent variable: Spanish emigration to Germany and France weighted by Spanish population

$$\underset{}{spmi_t} = \underset{(-1.27)}{-0.079} + \underset{(9.29)}{0.503spmi_{t-1}} - \underset{(-2.66)}{0.769rpid_{t-1}} + \underset{(3.15)}{1.643\Delta rwd_t} + \underset{(2.76)}{1.164rwd_{t-2}} - \underset{(-3.95)}{0.298ud_t}$$
$$+ \underset{(2.94)}{1.757\Delta^2 did_t} - \underset{(-9.50)}{0.808\Delta ugf_t} + \underset{(2.65)}{0.063\Delta reg_{t-1}} - \underset{(-3.97)}{0.187dv_t}$$

$\bar{R}^2$	0.9865
SE	0.09763
DW	1.9108
	Test for Serial Correlation
LM for AR(1)	0.07311
LM for AR(2)	0.23422
Durbin'h for AR(1)	0.22839
	ARCH χ^2 Test
1 lag	1.5534
2 lags	2.0592
3 lags	2.1926
	Normality χ^2 Test
	0.532118
	Chow—F test for Structural Breakdown
1974	36.5393
1975	5.11212
1976	3.96567
	Test of Parameter Constancy
One forecast	7.3155
Two forecasts	3.4139
Three forecasts	2.2589

Nb. We report t—ratios in parenthesis. T—ratios are from heteroscedastic consistent standard errors. Durbin's h statistic test for AR(1) serial correlation when the lagged dependent variable is a regressor. If $|h|<1.645$ we accept the null of no serial correlation, at 5% confidence level.

LM test for AR(n) serial correlation is distributed as $\chi^2(n)$. We accept the null of no serial correlation at 5% confidence if LM<3.841 for AR(1) and if LM<5.991 for AR(2).

The ARCH χ^2 test is compared against $\chi^2(1)=3.841$, $\chi^2(2)=5.991$, and $\chi^2(1)=7.815$ at 5% confidence, respectively.

The Normality χ^2 test is compared against $\chi^2(1)=3.841$.

The F—statistic for structural breakdown is compared against $F_6^{10}(\alpha=5\%)=4.06$ and $F_6^{10}(\alpha=1\%)=7.87$.

The test of parameter constancy (Chow Forecast Test) is compared against $F_{0.05}(1,15)=4.54$ (8.53 at 1%), $F_{0.05}(2,14)=3.74$ (6.51 at 1%), and $F_{0.05}(3,13)=3.49$ (5.95 at 1%), respectively.

Table 2A4.
Emigration Equations by OLS for 1962—88.
Dependent variable: Spanish emigration to Germany and France weighted by Spanish population

$$\underset{}{\mathrm{spmi}_t} = \underset{(-3.68)}{-0.336} + \underset{(5.24)}{0.380\mathrm{spmi}_{t-1}} - \underset{(-2.44)}{0.881\mathrm{rpid}_{t-1}} + \underset{(3.61)}{2.256\Delta\mathrm{rwd}_t} + \underset{(2.79)}{1.529\mathrm{rwd}_{t-2}} - \underset{(-6.16)}{0.417\mathrm{ud}_t}$$
$$+ \underset{(3.07)}{1.991\Delta^2\mathrm{did}_t} - \underset{(-7.69)}{0.724\Delta\mathrm{ugf}_t} + \underset{(1.48)}{0.044\mathrm{reg}_t} - \underset{(-3.58)}{0.241\mathrm{dv}_t}$$

$\bar{R}^2$	0.98582
SE	0.10606
DW	1.81841
	Test for Serial Correlation
LM for AR(1)	0.05310
LM for AR(2)	0.30765
Durbin'h for AR(1)	0.38226
	ARCH χ^2 Test
1 lag	2.2328
2 lags	2.9301
3 lags	4.6435
	Normality χ^2 Test
	0.4368
	Chow—F test for Structural Breakdown
1974	6.1965
1975	5.8403
1976	5.8861
	Test of Parameter Constancy
One forecast	0.02145
Two forecasts	1.75342
Three forecasts	1.16333

Nb. We report t—ratios in parenthesis. T—ratios are from heteroscedastic consistent standard errors.
Durbin's h statistic test for AR(1) serial correlation when the lagged dependent variable is a regressor. If $|h|<1.645$ we accept the null of no serial correlation, at 5% confidence level.

LM test for AR(n) serial correlation is distributed as $\chi^2(n)$. We accept the null of no serial correlation at 5% confidence if LM<3.841 for AR(1) and if LM<5.991 for AR(2).

The ARCH χ^2 test is compared against $\chi^2(1)=3.841$, $\chi^2(2)=5.991$, and $\chi^2(1)=7.815$ at 5% confidence, respectively.

The Normality χ^2 test is compared against $\chi^2(1)=3.841$.

The F—statistic for structural breakdown is compared against $F_7^{10}(\alpha=5\%)=3.63$ and $F_7^{10}(\alpha=1\%)=6.62$.

The test of parameter constancy (Chow Forecast Test) is compared against $F_{0.05}(1,16)=4.49$, $F_{0.05}(2,15)=3.68$, and $F_{0.05}(3,14)=3.34$, respectively.

Table 3.
Non—Nested Tests for Competing Models.

1. Embedding within a general model.

Return migration.	
model 1.A.1.(i)	**F(2,14)=4.68157 > 3.74 at 5%**
	< 6.51 at 1%
model 1.A.1.(ii)	**F(2,14)=0.32654 < 3.74**
model 1.A.2.(i)	**F(3,14)=3.75228 > 3.34 at 5%**
	< 5.56 at 1%
model 1.A.2.(ii)	**F(3,14)=2.22098 < 3.34**
Emigration.	
model 2.A.1.	F(8,10)=1.632607 < 3.07 at 5%
model 2.A.2.	F(7,10)=0.868336 < 3.14 at 5%
model 2.A.3.	F(6,10)=0.709498 < 3.22 at 5%
model 2.A.4.	F(6,10)=0.801775 < 3.22 at 5%

2. Discrimination (Akaike Information Criterion).

Return migration.	
model 1.A.1.(i)	AIC=—12.72611
model 1.A.1.(ii)	AIC=—24.85535
model 1.A.2.(i)	AIC=—10.69974
model 1.A.2.(ii)	AIC=—15.91939
Emigration.	
model 2.A.1.	AIC= 4.68269
model 2.A.2.	AIC=—4.69453
model 2.A.3.	AIC=79.91021
model 2.A.4.	AIC=79.41493

3. Vuong (1989) Test.

Return migration.
LRV(1,2)=—1.942074
LRV(1,3)= 0.6214899
LRV(1,4)=—0.5361487
LRV(2,3)= 1.966946
LRV(2,4)= 1.781154
LRV(3,4)=—1.000233

Emigration.
LRV(1,2)=—1.665641
LRV(1,3)=—1.729062
LRV(1,4)=—1.734353
LRV(2,3)=—0.7691016
LRV(2,4)=—0.8613986
LRV(3,4)= 0.3550294

Notes.

The Akaike Information Criterion is based on $AIC=-2\log L(\beta)+2N$ and it chooses the model with the lowest AIC.

The F test of restrictions on a general model is based on

H_1: $y_t=x_t'\beta+\epsilon_t$

H_2: $y_t=z_t'\gamma+\epsilon_t$

We then construct the embedding general model $y_t=x_t'\beta+z_t'\gamma+\epsilon_t$ and test for restrictions using the F statistic.

The Vuong test is a LR test of non–nested hypothesis between two competing models. It is calculated as follows:

$$LRV=\frac{\hat{L}_{H_1}-\hat{L}_{H_2}}{\sqrt{\Sigma\hat{m}_i^2-\frac{1}{N}(\hat{L}_{H_1}-\hat{L}_{H_2})}}$$

where $\hat{m}_i=\hat{l}_{(H_1)i}-\hat{l}_{(H_2)i}$

$\hat{L}$ represents the maximised log–likelihood.

$\hat{l}_i$ represents the estimated log–likelihood for each observation.

N is the sample size.

Under the null hypothesis that the two competing models fit the data equally well, LRV has a distribution N(0,1) in large samples. The test for model selection works in the following way. We choose the 5% significant level critical value from the standard normal distribution, then

If $|LRV|\leq 1.645$ we cannot discriminate between the two competing models given the data.
If $LRV<-1.645$ we reject the null in favour of model 2 being better than model 1.
If $LRV>1.645$ we reject the null in favour of model 1 being better than model 2.

Data Appendix.

Migration Flows Data. The data on Spanish flows are from the German and French Statistics Yearbooks, respectively. It is not the data on emigrants assisted by the Spanish Emigration Institute, but the data on Spaniards going into and leaving Germany, for reasons different than tourism, provided by the German customs statistics. The French data also come from similar sources. The variables used are constructed as follows:

spmigr: Spaniards migrating to Germany (outflow) divided by Spanish population and multiplied by 1000.

spmifr: Spaniards migrating to France (outflow) divided by Spanish population and multiplied by 1000.

spbkgr: Return Spanish migration from Germany (inflow) divided by Spanish population and multiplied by 1000.

stock: It is the stock variable which represents the Spaniards in Germany. As we do not have the stock of Spaniards in Germany prior to 1960, we consider it as zero in 1959 and construct the variable by adding to the previous year stock the net flow of Spaniards to Germany of the current year. It is divided by the Spanish population and multiplied by 1000. Some caveats apply to this variable, as it ignores mortality and Spaniards who migrate to and from third countries.

Price Data. It comes from IMF, Supplement of Price Statistics, No.12, and it is completed using the German, Spanish, and French Statistics Yearbooks, together with OECD, Historical Series. We will use the respective consumer price indices to calculate real values.

lrpigr, lrpisp and lrpifr: log of real rents price in Germany, France and Spain.

lrpid: lrpigr – lrpisp lrpid1: lrpifr – lrpisp

Income or Earning data. All the data used comes from the OECD: National Accounts, 1960–1988, and is complemented by the German, Spanish, and French Statistics Yearbooks. We construct the following variables:

lrwgr, lrwsp and lrwfr: log of real wage rate per worker employed, from 1960 to 1988. Spanish wages are not available until 1963. Therefore, we have estimated 1960–62 by regressing Ln(RWSP) on Ln(Real aggregate WSP), lagged, trend, constant, for 1963 to 1973 and using fitted values to estimate 1960–62. We did the same regression, but with real industrial output index as regressor instead of real aggregate wage. The results differ after the third decimal, but very little.

lrw: log of German wages in Spanish prices, calculated by multiplying the German nominal wage index by the exchange rate index and deflated by the Spanish price index.

lrw = [[wgr*(ptadm)]index no./cpisp]*100 or

lrw = [[wgr*(ptadm)index no.]/cpisp]

ptadm and ptafr: exchange rate Spanish peseta DM/Franc (pesetas per DM/Franc).

lrwl: log of French wages in Spanish prices, calculated by multiplying the French nominal wage index by the exchange rate and deflated by the Spanish price index.

lrwd: lrwgr – lrwsp

lrwd2: lrw – lrwsp

lrpdigr, lrpdisp and lrpdifr: log of real per capita disposable income of Germany, Spain and France, from 1960 to 1988.

lrpdi:log of per capita disposable income of Germany in Spanish prices, calculated by multiplying the national disposable income per head of Germany by the exchange rate pta–dm. We then make an index number (1980=100) and deflate the index number by the Spanish consumer price index (1980=100), then multiply it by 100.

lrpdi1: log of per capita disposable income of France in Spanish prices.

lrpdid: lrpdigr − lrpdisp

lrpdi2: lrpdifr − lrpdisp

lrpdi3: lrpdi − lrpdisp

Labour Market Data. This data comes from the OECD, Statistics of Labour Force, and the OECD, Historical Series. It is complemented using the German, Spanish, and French Statistics Yearbooks. We construct the following variables:

lugr, lusp and lufr: log of unemployment rate (as a percentage of the total labour force) in Germany, Spain and France, from 1960 to 1988.

lud: lugr − lusp

lud1: lufr − lusp

legr, lesp, lefr: log of employment in Germany, Spain, and France, 1960–1988.

legr1, lesp1: Growth rate of employment in Germany, and Spain, 1961–1988.

Nb. legr1=legr–legr(–1)=Ln(egr)–Ln(egr(–1))=

(egr–egr(–1))/egr(–1)

legrd: legr1–lesp1.

We finally construct the aggregated variables in the following way:

spmi = 1/2*(spmigr+spmifr)

rpid = 1/2*(lrpigr+lrfifr) − lrpisp

rwd = 1/2*(lrwgr+lrwfr) − lrwsp

ud = 1/2*(lugr+lufr) − lusp

did = 1/2*(lrpdigr+lrpdifr) − lrpdisp

egrd = 1/2*(legr1+lefr1) − lesp1

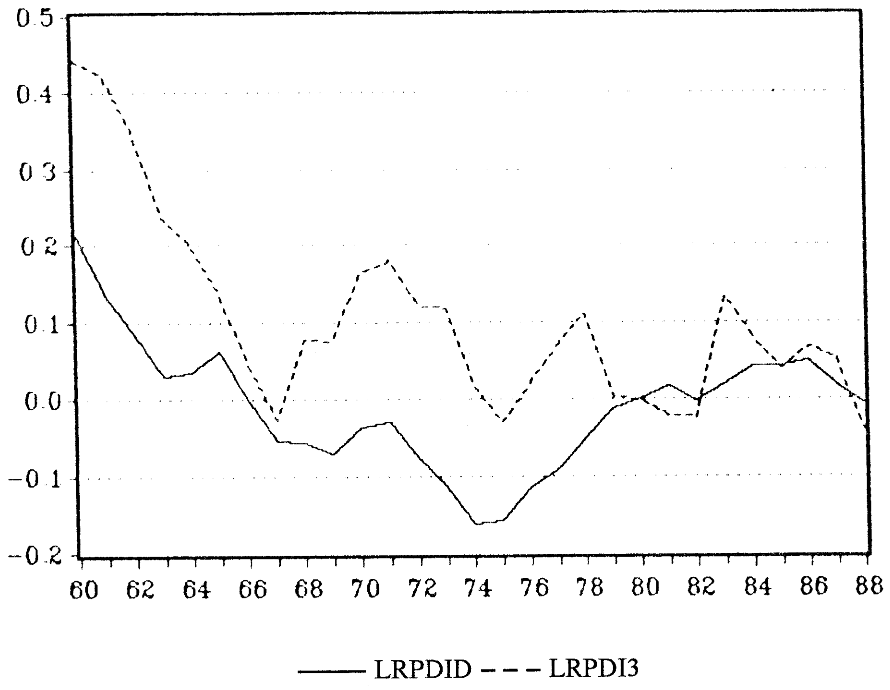
rwds = 1/2*(lrw+lrw1) − lrwsp

dids = 1/2*(lrpdi+lrpdi1) − lrpdisp

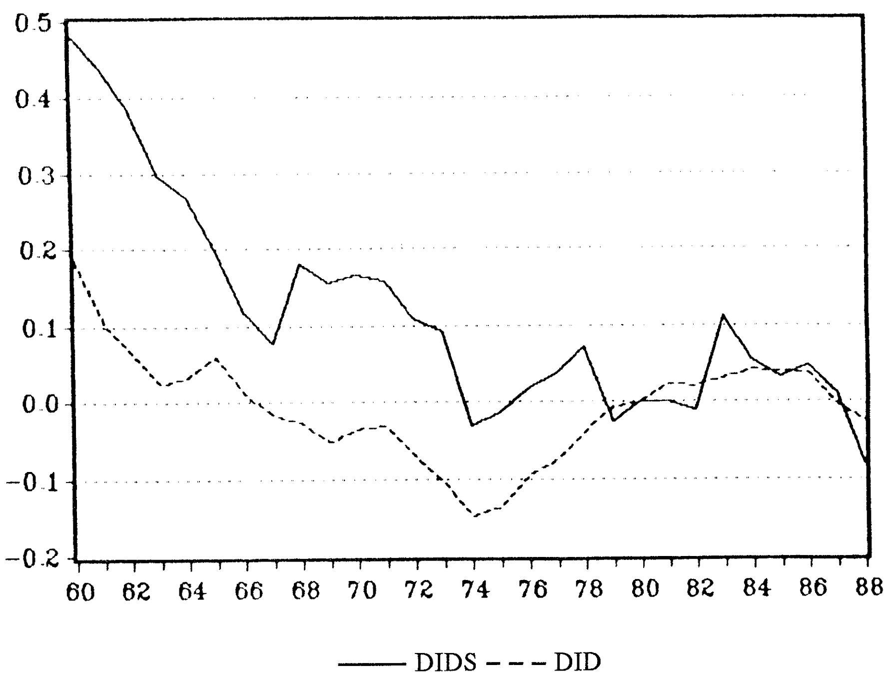
ugf = 1/2*(lugr+lufr)

dv: Dummy variable to control for the Spanish wage boom, the higher level of union pressure, and the political transition. This variable is 1 from 1973 (death of Franco's Prime Minister) to 1977 (Pactos de la Moncloa), and zero otherwise.

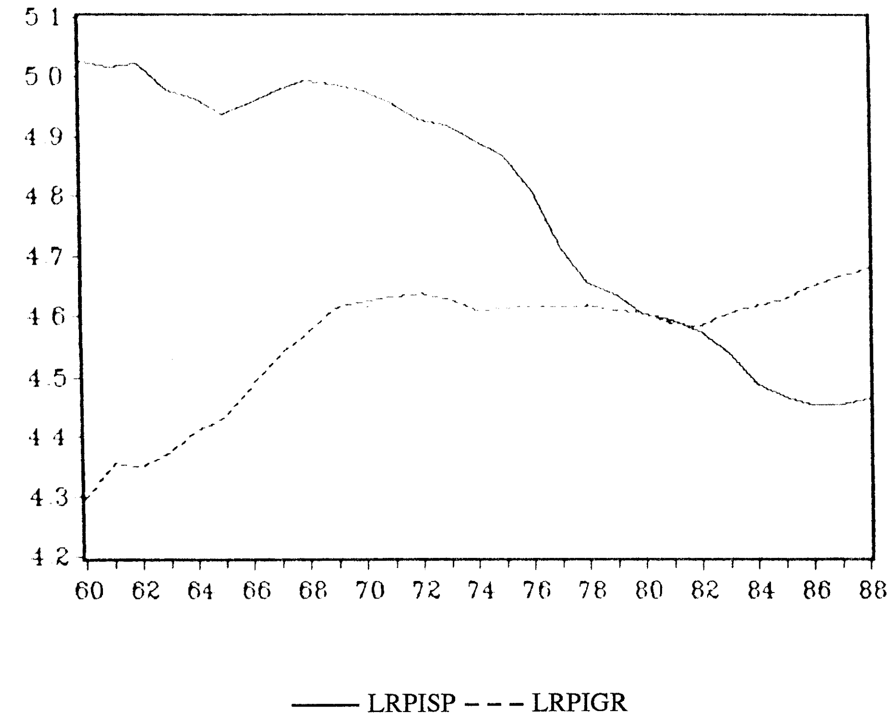
Differential between the logs of the German and the Spanish Per Capita Disposable Income in national prices, LRPDID and in Spanish prices, LRPDI3



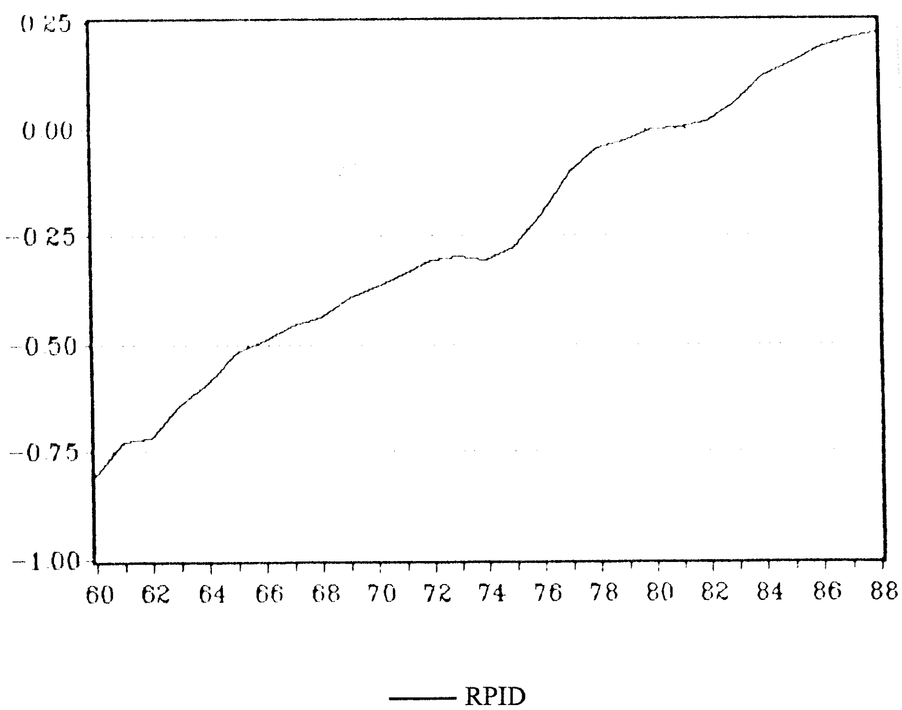
The Average of the log of the German and French Personal Disposable Income minus the log of the Spanish Personal Disposable Income, in national prices, DID, and in Spanish prices, DIDS



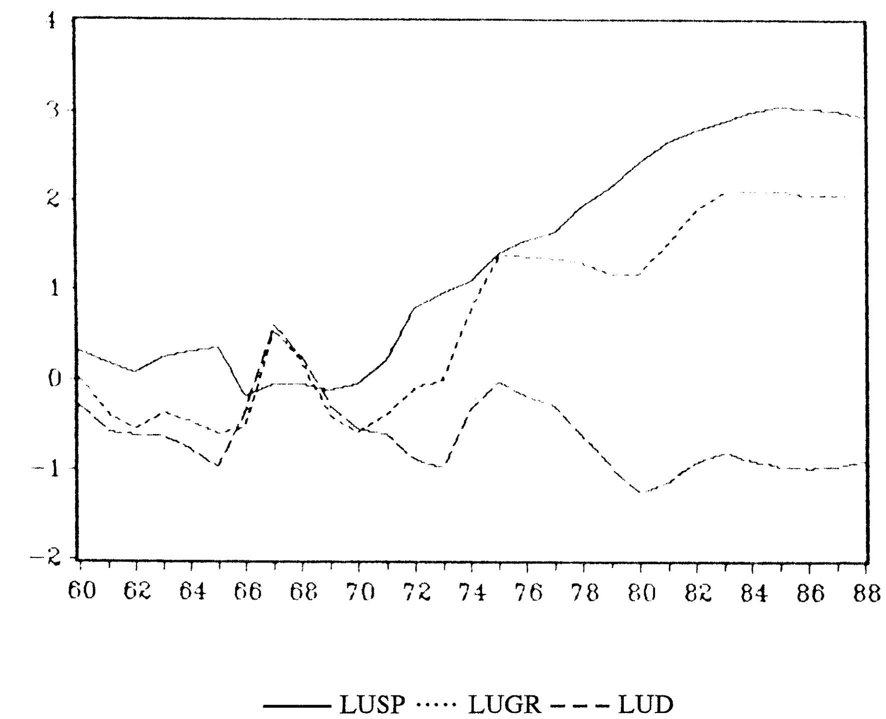
Log of the German, LRPIGR, and the Spanish, LRPISP
Real Rent Price



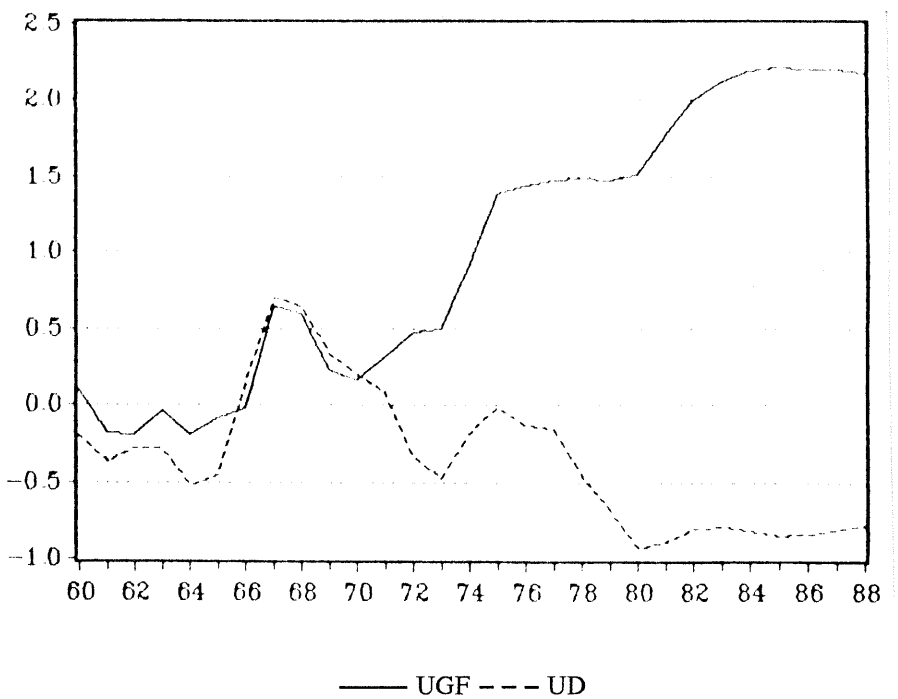
Differential between the Average of the French and German
Real Rent Prices, and the Spanish Real Rent Price In Logs

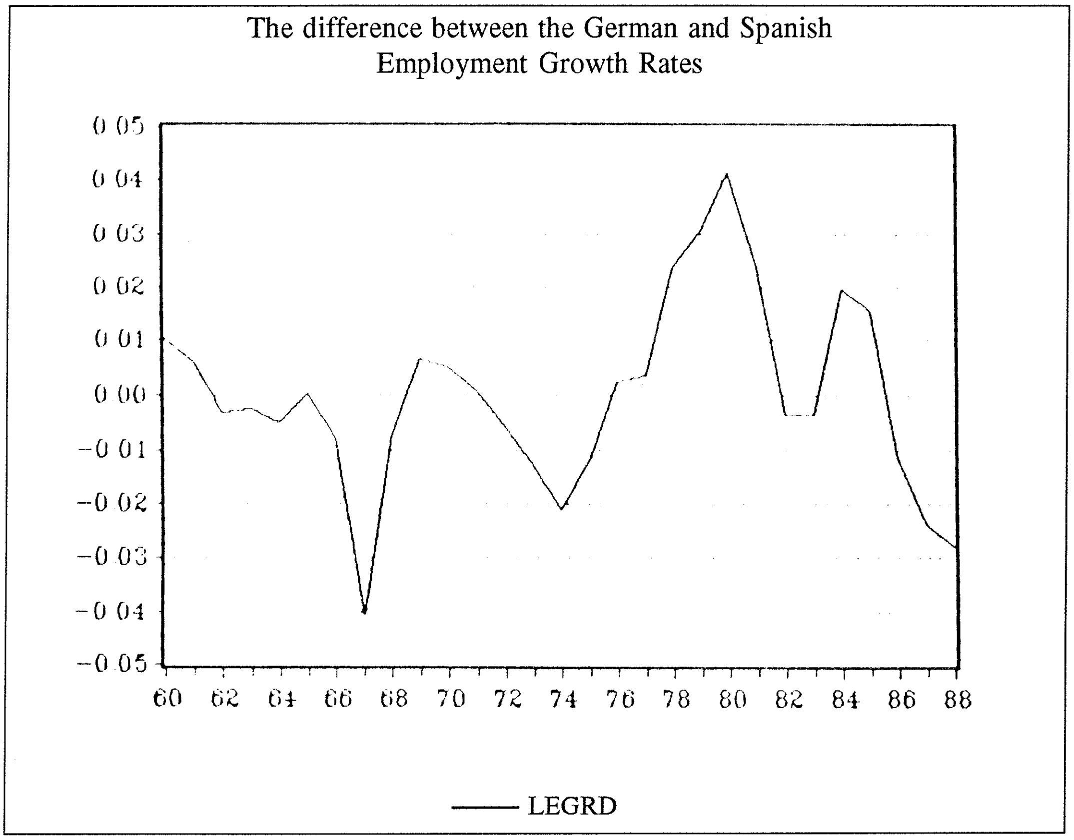


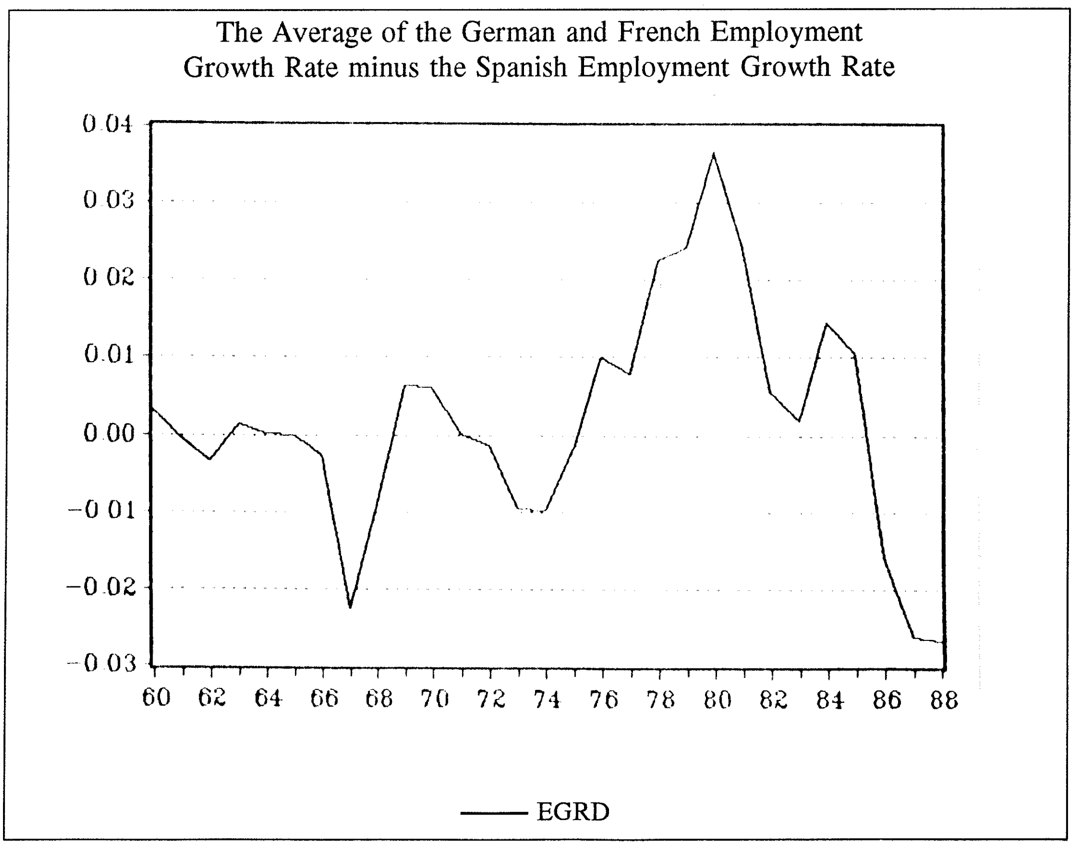
Log of the Spanish Unemployment Rate, LUSP, the German Unemployment Rate, LUGR, and their Differential, LUD



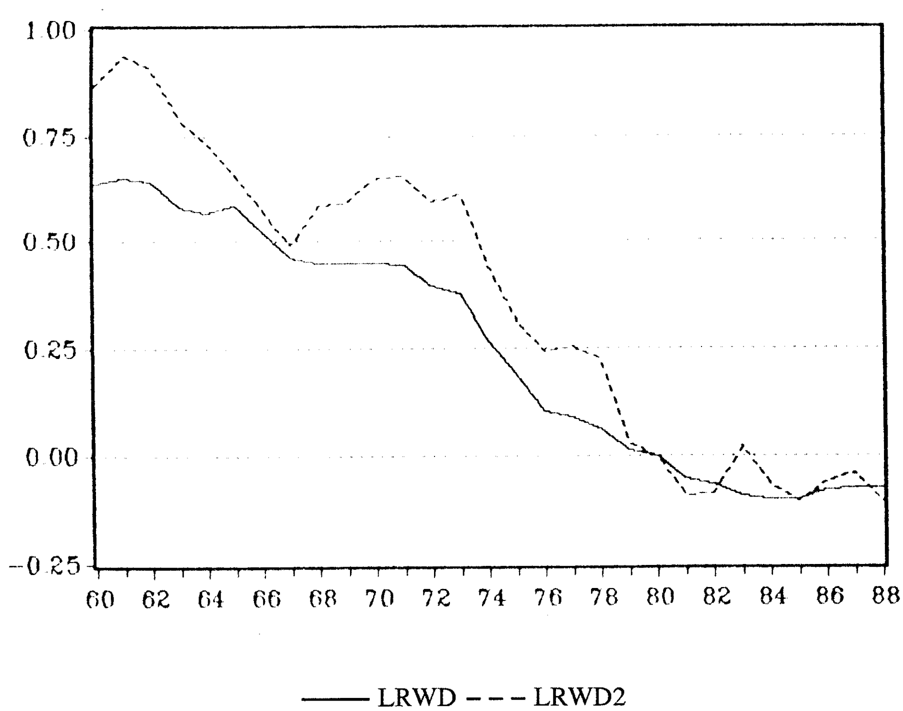
The Average Unemployment Rate of Germany and France (solid line) and the differential with respect to the Spanish unemployment rate (dotted line), ln logs



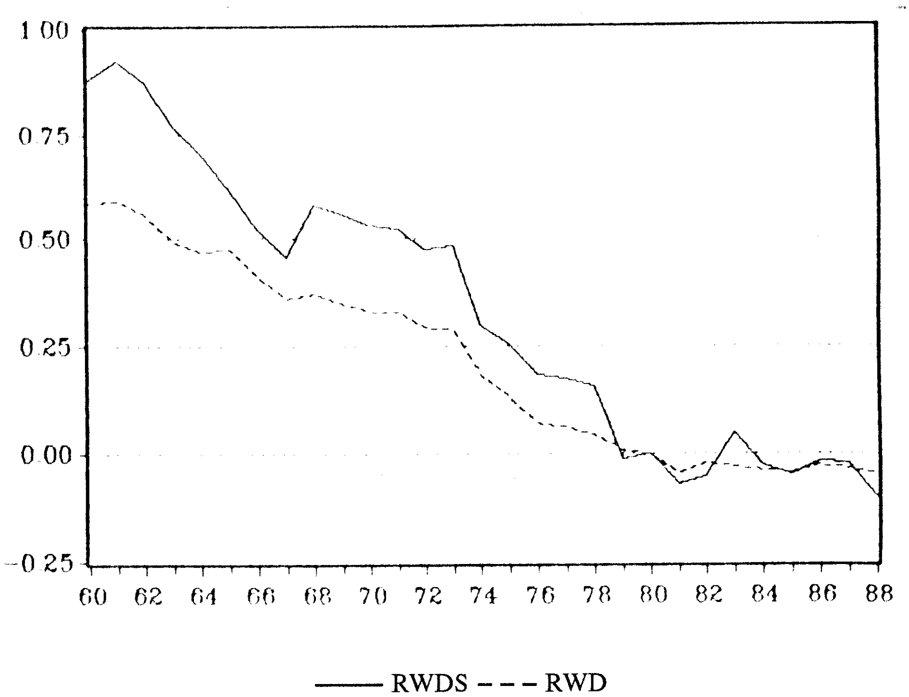

The difference between the German and Spanish
Employment Growth Rates
0.05
0.04
0.03
0.02
0.01
0.00
-0.01
-0.02
-0.03
-0.04
-0.05
60 62 64 66 68 70 72 74 76 78 80 82 84 86 88
LEGRD

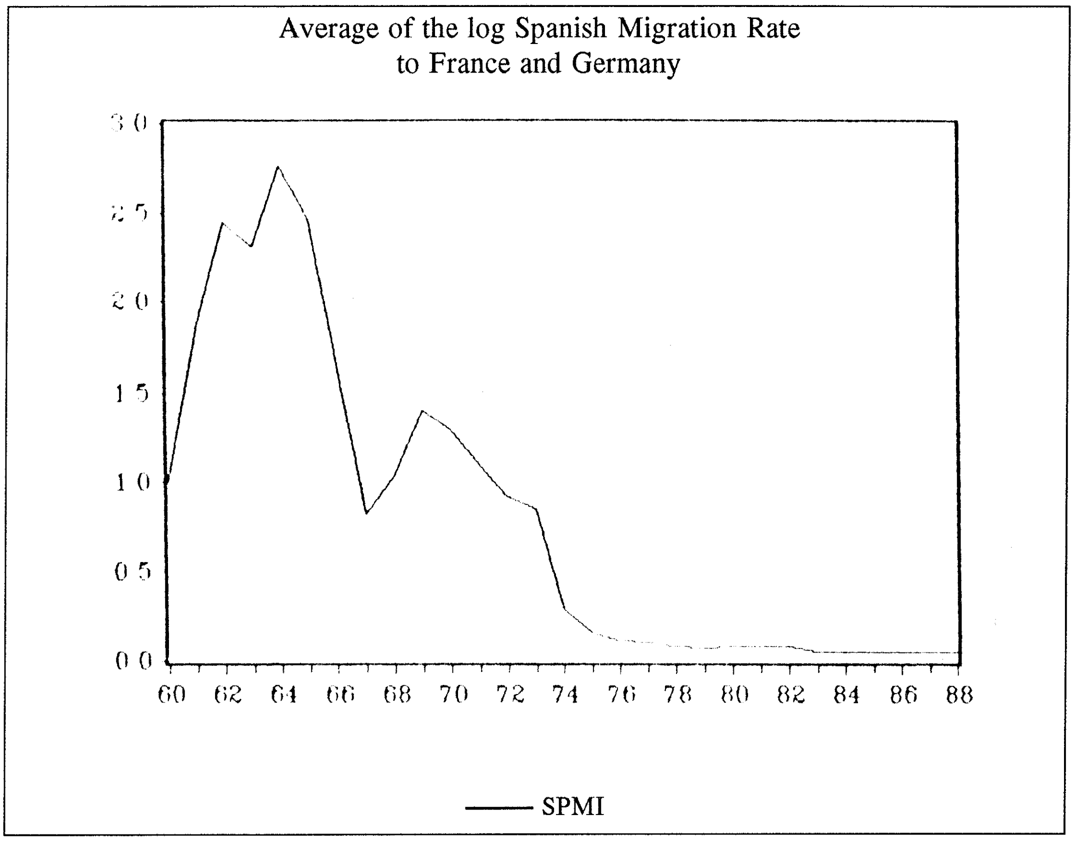

The Average of the German and French Employment
Growth Rate minus the Spanish Employment Growth Rate
0.04
0.03
0.02
0.01
0.00
-0.01
-0.02
-0.03
60 62 64 66 68 70 72 74 76 78 80 82 84 86 88
EGRD

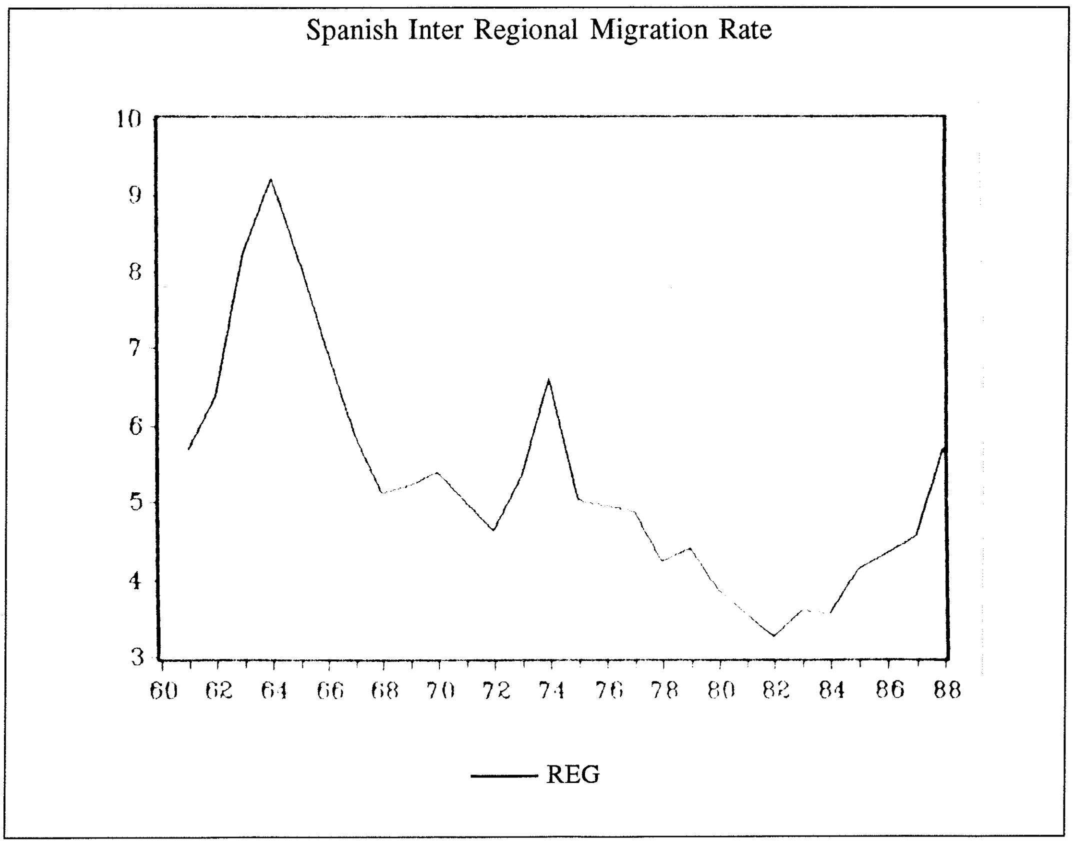
Differential between the log of Germany and Spanish in national prices (solid line) and in Spanish prices (dotted line)

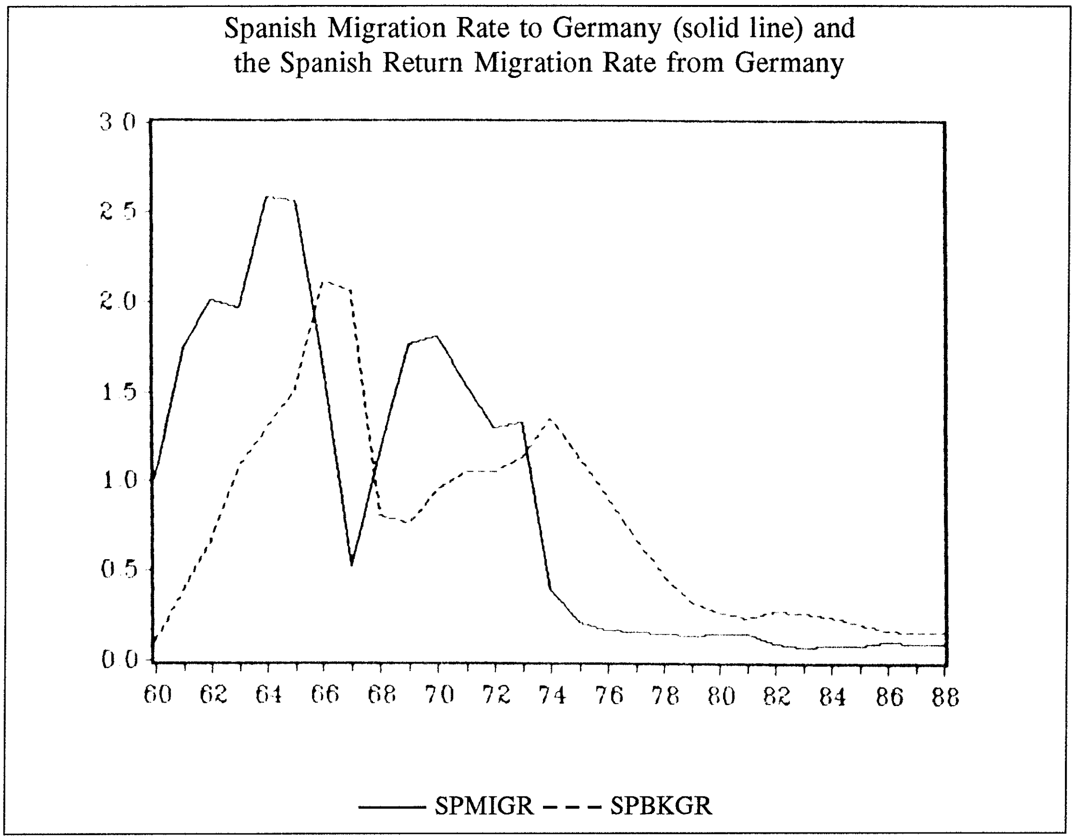


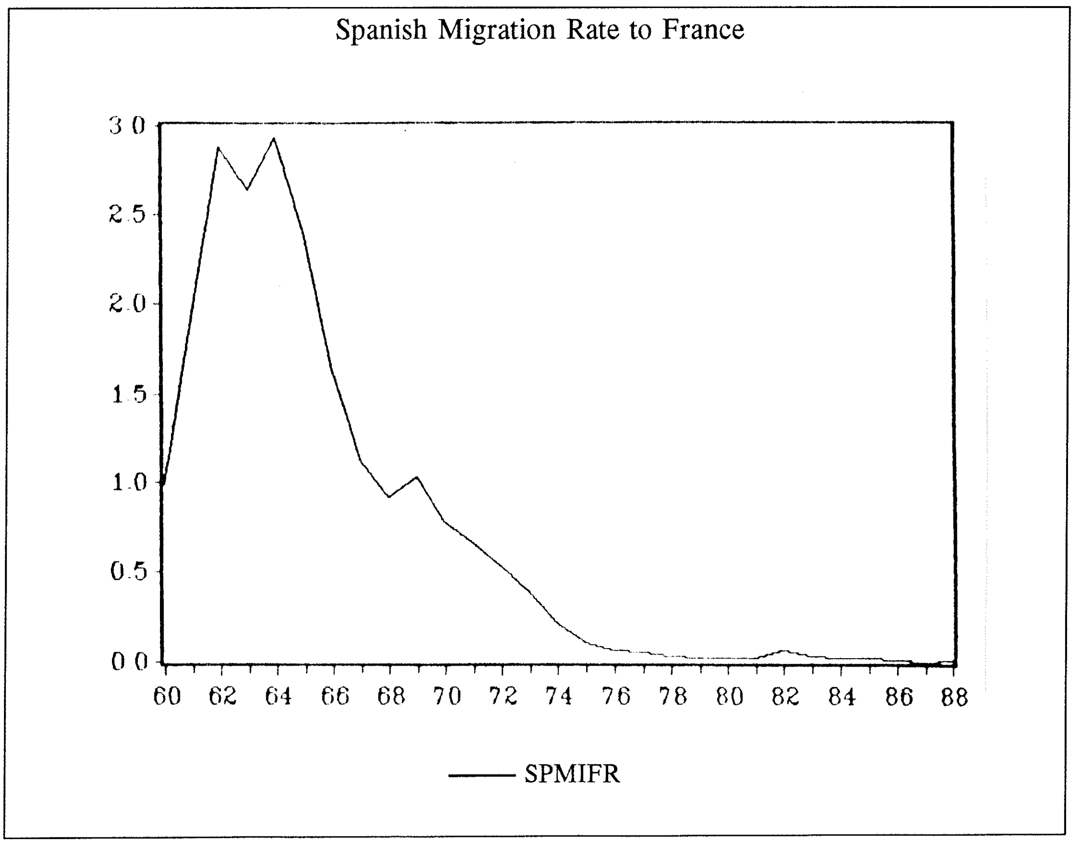
Differential between the average of Germany and French real wages, and Spanish real wages in national prices (solid line) and in Spanish prices (dotted line)




Average of the log Spanish Migration Rate
to France and Germany
3.0
2.5
2.0
1.5
1.0
0.5
0.0
60 62 64 66 68 70 72 74 76 78 80 82 84 86 88
SPMI


Spanish Inter Regional Migration Rate
10
9
8
7
6
5
4
3
60 62 64 66 68 70 72 74 76 78 80 82 84 86 88
REG


Spanish Migration Rate to Germany (solid line) and
the Spanish Return Migration Rate from Germany
3.0
2.5
2.0
1.5
1.0
0.5
0.0
60 62 64 66 68 70 72 74 76 78 80 82 84 86 88
SPMIGR
SPBKGR


Spanish Migration Rate to France
3.0
2.5
2.0
1.5
1.0
0.5
0.0
60 62 64 66 68 70 72 74 76 78 80 82 84 86 88
SPMIFR

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